IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

  Masanobu SATO, et al.

Serial No.: 10/767,756

Filed: January 28, 2004

For: SUBSTRATE TREATMENT METHOD AND SUBSTRATE TREATMENT
  APPARATUS

Confirmation No.: 5571

Date: July 19, 2008

Group Art Unit: 1792

Examiner: Nicole R Blan

VIA EFS-WEB
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. §1.132

SIR:

  Masanobu SATO declares as follows:

  1. I am an inventor of the subject matter that is disclosed and claimed in the above-identified patent application.

  2. I submit this Declaration in response to the rejection of the claims in the present application on the basis of the assertion by the Patent Examiner in the Office Action dated March 19, 2008 (Office Action).

  3. I have an undergraduate degree in Physics from Ritsumeikan University and have completed the first course of the Graduate School of Science and Engineering.

  4. I am currently a Manager of Process Technology Department 1 at the Process Technology Division of DAINIPPON SCREEN MFG. CO., LTD., the assignee of the above-identified patent application.

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5.   I have been engaged in developing cleaning technologies for semiconductors for the past twelve years.

6.   I have studied U.S. Patent No. 5,918,817 to Kanno et al. (hereinafter "Kanno") and U.S. Publication No. 2003/0170988 to Izumi et al. (hereinafter "Izumi").

7.   Kanno discloses a two-fluid jet nozzles.

8.   Prior to the above-identified patent application, it was not known in the technical field of substrate treatment using a treatment liquid to express a diameter of treatment liquid droplets in terms of a volume median diameter. Instead, the diameter of treatment liquid droplets was expressed in terms of an arithmetic mean diameter.

9.   Prior to the above-identified patent application, a person skilled in the art of substrate treatment using a treatment liquid would have understood Kanno's teaching of the "particle sizes of the droplets" being "about 20μm, about 10μm, about 5μm and about 2μm" to mean that the arithmetic mean of the produced droplets' diameters is, respectively, about 20μm, about 10μm, about 5μm and about 2μm.

10.   It is well known that droplets generated by two-fluid jet nozzles cannot be "one size droplets" but must have a broad diameter distribution, for example, as shown in Fig. 11 of the above-identified patent application.

11.   Where droplets have a broad diameter distribution, a volume median diameter indicates whether really large diameter droplets or really small diameter droplets are present in the distribution. Arithmetic mean of the same distribution does not provide the same indication.

12.   For a broad diameter distribution, an arithmetic mean of the distribution does not correlate to a volume median of the same distribution.

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13. Izumi teaches a bi-fluid nozzle producing droplets of the pretreatment liquid, each droplet having "a diameter of about 5μm to about 20μm."

14. Because the diameter of each droplet is limited to the range of about 5μm to about 20μm, a volume median diameter of the Izumi distribution cannot be smaller than about 5μm and cannot be greater than about 20μm.

15. I further declare that all statements made herein are made of my own knowledge and are true except for those statements made on information and belief, which are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this declaration of this application and any United States patent issuing therefrom.

July 22, 2008

Date

Masanobu Sato

Signature